

- US Patent 5,897,498 (“Canfield”), filed October 27, 1997.

B. Overview of Office Action

3. The office action:
 - a) included claims 17-22 in group II of the restriction requirement,
 - b) upheld the restriction of claims 8-16,
 - c) rejected claims 1-7, 23-27, 33, 34, and 36 as being anticipated by Wood under 35 U.S.C. 102(a), and
 - d) rejected claim 32 as being obvious in light of Wood under 35 U.S.C. 103(a).
 - e) rejected claim 35 as requiring new matter 35 U.S.C. 112.

C. Claims Cancelled Based on Restriction Requirement

4. Claims 28-31 were cancelled earlier based on the restriction requirement.

As required by the restriction requirement, please cancel claims 8-22 without prejudice,.

5. Claims 1-7, 23-27 and 32-36 were considered and are still pending.

D. Claim Rejections under 35 U.S.C. 102

6. The office action rejected claims 1-7, 23-27, 33, 34, and 36 as being anticipated by Wood under 35 U.S.C. 102(a). The office action cited Wood teaching various elements of the pending claims. Reconsideration of these claims is requested with proper understanding of the claim terms and the terminology used in the Wood disclosure.

Terminology

7. Wood teaches an invention that combines two areas of art: one the art of medical imaging, specifically ultrasound imaging; and the second, the art of computer graphics images and video as generally used with the World Wide Web (“Web”). Both of these areas of art have specific technical terms of art. The same word may have a substantially different

meaning in one art area than that word would have in the other art area. This is true of several terms in the convergent areas covered by both Wood and the present application. For example, the word “image” may mean one thing to a medical doctor and a substantially different thing to a computer graphics expert. One skilled in art of these applications would need to have an understanding of both the art of medical imaging and the art of computer graphics and video and would have to carefully read the specifications to determine the proper meaning of the word in a particular context.

Different Meanings of “Image”

8. In computer graphics and video, an “image” is a single graphic or a single frame of a video. For example, the two most common types of images on the Web are GIF images and JPEG images. These are generally limited to a single graphic. There is also a file format known as animated GIF that allows for a relatively small finite sequence of predetermined animation frames that are played back as an animation.

9. On the other hand, in the medical imaging, an “image” may be a single frame, a sequence of multiple frames, or a live display of an infinite sequence of frame being viewed real time. When a relatively small finite number of predetermined frames are stored together, the collection is referred to as a “cineloop”. (A cineloop typically contains less than 30 frames such as a single heart cycle or a one second capture of frames at 30 frames a second.) The live, real-time display of medical data is also referred to as the “image”.

10. It is clear from the Wood specification that the term “image” is used to refer to single frame, such as a JPEG or GIF image, or to a finite number of predetermined frames, such as a cineloop. See “image”, “cineloop”, and “click an image” in Figures 5 and 14, “images” in Figures 12 and 13, JPEG and GIF images (10:2-9). The description of the update button in Fig 10 (11:44-49) shows that the remotely displayed image is a *single frame* that is

updated by displaying the “ultrasound image most recently produced”. Cineloops are described as “animated real time loops of images” (i.e. loops of single frames) that are displayed in HTML Web pages (8:10-15) (e.g. animated GIFs). These uses are all consistent with the term as used in the field of computer graphics and video as used in the Web and are *not* consistent with the term as used in medical imaging.

Different Meanings of “Video”

11. In computer graphics and video, a “video” is a movie or a relatively long or infinite sequence of frames. For example, the two most common types of video on the Web are QuickTime movies and Video for Windows (now known as Windows Media movies). These are capable of containing relatively long movies (over 2 hours) and can include live streaming video where the sequence of frames is not predetermined or finite. Digital video cameras are capable of producing an infinite stream of video frames.

12. On the other hand, in the medical imaging, the term “video” is not used to describe the medical image, but is used to describe conventional video devices, such as a video display, video tape, and video tape players.

13. It is clear from the Wood specification that the term “video” is used in the Internet Web or conventional sense. (See, e.g. 3:6-9). Prior to the invention of the present application, live Internet streaming of clinical quality medical video was not possible with conventional equipment and Internet connections known to Wood. This is precisely why Wood does not disclose the display of live transmissions of video. Instead, Wood teaches transmission of single frames or a relatively small or finite number of predetermined frames in a cineloop (see the entire discussion of image above).

Live, Real-time, and Store-and-Forward

14. In the context of video transmission systems, the terms live, real-time, and store and forward have different meanings. Live video is video that can be viewed as it is being transmitted. Real-time video is displayed at the same frame rate that it was transmitted live, or at the same frame rate that it was captured (as opposed to slow motion). Because live video is always real-time, those skilled in the art sometimes use real-time to mean live. Video can be recorded and played back in real time. In a store-and-forward system, video frames can be captured in real-time, stored as a finite number of predetermined frames, transferred (or forwarded) at a rate *less than* real-time, and then played back in real time.

Wood Is Not Live, But Store-and-Forward

15. Wood only uses of the term “real time” twice in conjunction with images (i.e. “animated real time loops of images” at 8:14-15, and “play the real time image sequence” at 9:62-63)¹. It is clear that both of these uses refer to real-time *playback* and not real time *transmission*. Wood only discloses a store-and-forward system, not a live system. “

Overview of Wood

16. Wood teaches an ultrasonic diagnostic imaging system with universal access to diagnostic information and images. Wood teaches that the medical ultrasonic diagnostic imaging system is capable of being accessed over data communication networks such as the Internet, making the ultrasonic images, diagnostic reports and ultrasound system diagnostics information and operation accessible to a conventional personal computer at virtually any remote location. Wood however appears to teach that only single images, or a relatively

¹ A third use of the term real time is used to describe the multitasking nature of the multi-tasking operating system (12:13-23).

small number of predetermined frames, are transmitted from the ultrasonic diagnostic imaging system to the user's computer, at a rate that is less than real time. Wood does not disclose the transmission of live, clinical quality medical video. Wood is limited to a Web based system where the sending computer includes an HTTP server (item 30 in Fig 1 and 2, and as shown in Fig 15 and 16) and the receiving computer includes a Web Browser (item 104 in Fig 1 and 3, and as shown in Fig 4-14).

Overview of the Present Invention

17. The present invention teaches an video communication system. The invention includes methods of and apparatus "for *transmitting video* images preferably allows a specially trained individual to remotely *supervise*, instruct, and *observe* administration of medical tests conducted at remote locations" (Summary of the Invention). In order to achieve the objectives of the invention, the system must be able to transmit live video, in real-time. "The transmitting device transmits the video images to the remote receiving device ... for live display" (Summary of the Invention). Unlike Wood, the present invention is capable the transmission of live, clinical quality medical video with conventional computer equipment and readily available Internet connections. Unlike Wood, the present invention is not limited to the HTTP Server and Web Browser.

E. Claims 1, 23, 33 Not Anticipated by Wood

18. Claims 1 and 23 require a "video image". Claim 33 requires "video being transmitted". As discussed above in regard to the Wood terminology for "image" and "video". Wood's image is not a video image. Wood's image is a single frame, or an animated GIF, but is not the same or equivalent to the video image, or video, required by independent claims 1, 23, and 33. This fundamental element of the claimed invention is entirely lacking in Wood. For this reason alone, all three independent claims and their dependent claims should be allowed.

19. A transmitter as claimed by the present invention is not a modem as disclosed by Wood. The transmitter of the present invention must be able to “functions as a server within the computer network”, can be can be couple to both a video source 101 and a recorded video device 104 (see, discussion regarding Fig 1). A modem cannot function as a computer network server. A modem cannot be connected to both a video source and a recorded video device at the same time. A modem is not the same as, or equivalent to, the transmitter of the present invention.

20. Thus, Wood does not teach all of the required elements of the claimed invention. Further Wood teaches away from being able to transmit live, clinical quality video, an instead teaches receipt of single frames, or a pre-recorded cineloop, in a conventional store-and-forward approach. Thus, Wood does not render the claims obvious.

F. Claim 2 Not Anticipated by Wood

21. Claim 2 requires a “compressor for compressing ... the video image”. Wood only discloses JPEG and GIF compressors that are typically used only for still images not video images. Wood does not teach a video image compressor. In this regard, Wood teaches away from using a video compressor.

22. A JPEG or GIF compressor is not the same as, or equivalent to, the compressor of the present invention.

23. Thus, Wood does not teach all of the required elements of the claimed invention. Further Wood teaches away from a compressor that is enabling to transmit live, clinical quality video, an instead teaches compression of single frames, or a pre-recorded cineloop, or a GIF animation. Thus, Wood does not render claim 2 obvious.

G. Claim 3 Not Anticipated by Wood

24. Claim 3 requires a “decompressor” for decompressing “compressed stream of data”. Wood does not clearly teach a decompressor for a video stream.

25. A JPEG or GIF decompressor is not the same as, or equivalent to, the decompressor of the present invention.

26. Thus, Wood does not teach all of the required elements of the claimed invention. Further Wood teaches away from a decompressor that is enabling to display live, clinical quality video. Thus, Wood does not render claim 3 obvious.

H. Claim 4 Not Anticipated by Wood

27. Claim 4 requires a “recording device ... for storing the data representing the video image...”. Wood does not clearly teach a recording device for storing a video image.

28. An image store storing a single frame, or a relatively small number of frames such as a cineloop, is not the same as, or equivalent to, the recording device of the present invention.

29. Thus, Wood does not teach all of the required elements of the claimed invention. Further Wood teaches away from a recording device that is enabling to replay and real-time transmission of clinical quality video. Thus, Wood does not render claim 4 obvious.

I. Claims 5 and 24 Not Anticipated by Wood

30. Claims 5 and 24 are dependent claims and, for all the reasons stated above with respect to independent claims 1 and 23, should be patentable over Wood.

J. Claims 6 and 25 Not Anticipated by Wood

31. Claims 6 and 25 are dependent claims and, for all the reasons stated above with respect to independent claims 1 and 23, should be patentable over Wood.

32. Further, claim 6 requires a “network... for transporting the data representing the video image”. Wood does not clearly teach data representing a video image.

33. An data representing a single frame, or a relatively small number of frames such as a cineloop, is not the same as, or equivalent to, the recording device of the present invention.

34. Thus, Wood does not teach all of the required elements of the claimed invention and does not render claims 6 and 25 obvious.

K. Claims 7 and 26 Not Anticipated by Wood

35. Claims 7 and 26 are dependent claims and, for all the reasons stated above with respect to claims 1, 6, 23, and 25, should be patentable over Wood.

L. Claims 27 and 34 Not Anticipated by Wood

36. Claims 27 and 34 are dependent claims and, for all the reasons stated above with respect to independent claims 23 and 33, should be patentable over Wood.

37. Claim 27 requires user remote control of “parameters of plurality of *video* images including *frame rate* and *frame size*” (emphasis added). While Wood does user remote control of the medical device, Wood does not clearly teach controlling video parameters. There is no teaching of controlling video frame rate or video frame size. In fact, the specification does not contain the terms “video frame”, “frame rate” or “frame size”.

38. Claim 34 requires an element were a user “control command specifies a *subset of the area* of said digitized *frames* [of a *video being transmitted*]” (emphasis added). While Wood does user remote control of the medical device, Wood does not clearly teach controlling video parameters. There is no teaching of controlling the subset of the area of a video frame being transmitted live. In fact, the specification does not contain the term “subset”.

39. Thus, Wood does not teach all of the required elements of the claimed invention. Further Wood teaches away from a live observation of transmitted live, clinical quality video. Thus, Wood does not render claims 27 and 34 obvious.

M. Claim 36 Not Anticipated by Wood

40. Claim 36 is a dependent claim and, for all the reasons stated above with respect to independent claim 33, should be patentable over Wood.

41. Claim 36 requires an element were a user “control command allows the remote user to *start or stop* the *transmission* of said *video [being transmitted]*” (emphasis added). While Wood does user remote control of the medical device, as discussed above does not teach live transmission of video. Wood lacks any motivation for starting or stopping the transmission, because there is no video transmission. The claimed element would make no sense in the system as taught by Wood. There is no teaching of starting or stopping video transmission. In fact, the specification does not contain the terms “start” or “stop”. Further, starting and stopping transmission of a video is not inherent in the teaching of Wood.

42. Thus, Wood does not teach all of the required elements of the claimed invention. Further Wood teaches away from a live observation of transmitted live, clinical quality video. Thus, Wood does not render claim 36 obvious.

N. Claim Rejections under 35 U.S.C. 103

43. The office action rejected claim 32 as being obvious in light of Wood under 35 U.S.C. 103(a).

O. Claims 32 Not Rendered Obvious by Wood

44. The office action cited Wood for rendering claim 32 obvious. Claim 32 requires several elements not disclosed or taught by Wood. The elements of claim 32 include more than *broadly providing a mechanical means* to replace manual activity that can accomplish

the *same result*. In addition to adding a requirement for robotic device, claim 32 requires an element where the video image is “a *substantially live video*” and an element where the “remote receiver *receives* and *displays* said *live video* substantially *in real time*”, whereby the user can control the robotic device “while viewing the live video”. As discuss above Wood does not teach the required elements of “live video”, a receiver that “receives and displays said live video”.

45. The invention as claimed by claim 32 allows the doctor to perform a remote procedure while viewing live video. The live video feedback is required to enable the doctor to have correct perception to guide the doctor in performing a remote procedure. In a system as taught by Wood, the doctor cannot view the live video in real time; consequently the remote doctor cannot safely perform the remote procedure. The invention as claimed results in a *substantially new* and *different result* than the result possible with the teachings of Wood. This invention brings the hands of the physician to the medical device from a remote viewing location, which is much different than merely replacing the hands of a non-physician. Thus, Wood fails to render claim 32 obvious, even under the cited case law.

P. Rejection under 35 U.S.C. 112

46. The office action rejected claim 35 as requiring new matter 35 U.S.C. 112, in that “a plurality of video compressors” would constitute new subject matter. Applicant respectfully disagrees. The specification did teach a plurality of compression algorithms that could be selected remotely as now claimed by claim 35.

47. The specification provided the following support: “The compressor 204 preferably utilizes a *lossless compression* algorithm”, “the compressor 204 utilizes a *lossy algorithmic system*”, and “Preferably, the video controller 207 relays information regarding the frame size, frame rate, *compression algorithm*, and other parameters being transmitted to the